

Claims

What is claimed:

1. A circuit comprising a hybrid adapted to convert a bi-directional signal into an input signal and an output signal; and a signal subtractor adapted to receive said input signal and to subtract therefrom an estimated echo signal produced by an echo estimation unit adapted to derive said estimated echo signal from said output signal.
2. The circuit according to claim 1, wherein the echo estimation unit is comprised of an analog to digital converter, a digital filter and a digital to analog converter.
3. The circuit according to claim 2, further comprising a controller adapted to monitor said output signal and to regulate the transform characteristics of said digital filter as a function of one or more of said output signal's parameters.
4. The circuit according to claim 3, wherein the controller is adapted to regulate said digital filter such that said filter is adapted to transform a sampled version of said output signal into a sampled version of said estimated echo signal.
5. The circuit according to claim 4, further comprising a low pass filter between said digital to analog converter and said subtractor.

6. The circuit according to claim 1, further comprising a second hybrid, a second subtractor, and a second echo estimation unit adapted to derive a second estimated echo signal from an output signal of said second hybrid.
7. The circuit according to claim 6, wherein said second echo estimation unit is comprised of a second digital filter operatively connected to said controller.
8. The circuit according to claim 7, wherein said controller is adapted to regulate said second digital filter's transform characteristics such that said second digital filter is adapted to transform a sampled version of said second output signal into a sampled version of said second estimated echo signal.
9. A system for repeating a digital signal, comprising a connector adapted to connect to a twisted pair of wires; and a circuit operatively connected to said connector comprising a hybrid adapted to convert a bi-directional signal into an input signal and an output signal; and a signal subtractor adapted to receive said input signal and to subtract therefrom an estimated echo signal produced by an echo estimation unit adapted to derive said estimated echo signal from said output signal.

10. The system according to claim 9, wherein the echo estimation unit is comprised of an analog to digital converter, a digital filter and a digital to analog converter.
11. The system according to claim 10, further comprising a controller adapted to monitor said output signal and to regulate the transform characteristics of said digital filter as a function of one or more of said output signal's parameters.
12. The system according to claim 11, wherein the controller is adapted to regulate said digital filter such that said filter is adapted to transform a sampled version of said output signal into a sampled version of said estimated echo signal.
13. The system according to claim 12, further comprising a low pass filter between said digital to analog converter and said subtractor.
14. The system according to claim 9, further comprising a second hybrid, a second subtractor, and a second echo estimation unit adapted to derive a second estimated echo signal from an output signal of said second hybrid.

15. The system according to claim 14, wherein said second echo estimation unit is comprised of a second digital filter operatively connected to said controller.
- 5 16. The system according to claim 15, wherein said controller is adapted to regulate said second digital filter's transform characteristics such that said second digital filter is adapted to transform a sampled version of said second output signal into a sampled version of said second estimated echo signal.
- 10 17. A method of reducing an echo in a first signal leaving a hybrid caused by leakage from a second signal entering the hybrid, said method comprised of sampling the second signal, filtering the sampled signal, converting the sampled signal into an analog signal and subtracting the analog signal from the first signal.
- 15 18. The method according to claim 17 further comprising adjusting a transform characteristic of the digital filter such that the output of the digital filter is a sampled version of an estimated echo signal.
- 20 19. The method according to claim 18, further deriving the transform characteristic from a parameter of the second signal.

20. The method according to claim 18, further comprising low pass filtering the output of a digital to analog converter.